

REMARKS

Applicant respectfully requests reconsideration of this application. Claims 43-61 are pending. Claim 56 has been amended. No claims have been cancelled or added. Therefore, claims 43-61 are now presented for examination.

Claim Objections

Claim 56 has been objected to because “the analog” lacks proper antecedent basis. The claim was intended to refer to “the analog photocell”, but the word “photocell” was inadvertently left out of the claim.

Claim 56 has been amended to refer to “the analog photocell”, and it is submitted that the amendment to the claim overcomes the claim objection.

Drawings

37 C.F.R. §1.83 (a)

The examiner has objected to the drawings under the provisions of 37 C.F.R. §1.83 (a), indicating that “The drawings must show every feature of the invention specified in the claims. Therefore, the scaled version of the output bases, at least in part, on ambient light conditions must be shown or the feature(s) canceled from the claim(s).” It is submitted that the drawings are appropriated as submitted.

It is submitted that the elements of the claims are shown. The basis of the Examiner’s objection is essentially a *mathematical value* that, by its nature, would not be illustrated fully in a block figure. The value is appropriately explained in the description of the drawing.

The specification indicates that:

To ensure that the dynamic range of the counter matches the dynamic range of the photocells, the sample and hold amplifier can be equipped to scale the input to VCO 130 as appropriate.

(Specification, p. 7. line 22 through p. 8, line 1) Figure 1 of the application shows the input to the VCO 130 being the output of the sample and hold amplifier 120, which receives as one of its inputs a global scale voltage 160. The scaling is provided by the elements shown in Figure 1 as follows:

The variance in ambient light of the scene ensures that the captured image has the proper contrast. To adjust the dynamic range of the VCO 130 to match the analog photocell, a global scaling voltage 160 can be applied to the sample and hold amplifier of each digital photocell to have a dynamic range consistent with the present ambient conditions.

(Specification, p. 8, lines 6-11) While, if the Examiner wishes, it would be possible to amend Figure 1 to amend the figure labels to describe the value of the global scaling voltage (a value that is applied to the sample and hold amplifier to provide a dynamic range consistent with the present ambient conditions), it is submitted that this is not necessary and would be inconsistent with the concept of a drawing. The drawing provides certain necessary information, but fuller explanation of the meaning of each element appropriately left for the specification. It is submitted that drawing illustrates the elements of the claims, and the specification appropriately provides additional details, including an explanation of the mathematical value of the global scale voltage.

It is respectfully submitted that the drawings as provided are appropriate and Applicant requests that the objection be removed.

Claim Rejections under 35 U.S.C. § 103(a)

Glasheen et al.

Claims 43 and 48 are rejected under 35 U.S.C. 103(a), as being unpatentable over U.S. Patent No. 6,354,733 of Glasheen et al. (“Glasheen”).

Claim 43 provides the following:

43. An apparatus comprising:
- an analog photocell;
 - a sample and hold amplifier, a first input to the sample and hold amplifier being an output from the analog photocell, a second input to the sample and hold amplifier being a reference voltage, the sample and hold amplifier producing an output that is a scaled version of the output of the analog photocell, the scaling of the output being controlled by the reference voltage; and
 - an analog to digital converter, the analog to digital converter converting the output of the sample and hold amplifier to a digital value, the scaled version of the output of the analog photocell being chosen to match a dynamic range of the analog photocell with a dynamic range of the analog to digital converter and being based, at least in part, on ambient light conditions.

Included in claim 43 is the provision for “a second input to the sample and hold amplifier being a reference voltage, the sample and hold amplifier producing an output that is a scaled version of the output of the analog photocell, the scaling of the output being controlled by the reference voltage” and that “the scaled version of the output of the analog photocell being chosen to match a dynamic range of the dynamic of the analog photocell with a dynamic range of the analog to digital converter and being based, at least

in part, on ambient light conditions.” It is respectfully submitted that these elements are not taught or suggested by Glasheen. Among other differences, Glasheen does not make any adjustments based on ambient light conditions.

Glasheen illustrates a system that is intended to measure the temperature of combustion by sensing infrared emissions. (See, Glasheen, col. 2, lines 48-53) The Office Action states that Glasheen includes “converting the output of the amplifier to a digital value, the scaled version of the output of the analog photocell being chosen to match a dynamic range of the A/D converter and being based, at least in part, on ambient light condition (see column 7, lines 45-65). However, what Glasheen provides in the signal conditioning stage of the system is the following:

From the signal chopper and PGA, the processor/controller obtains the raw values of the "light" signal 142 and the "dark" signal 144, each alternating according to the chopper frequency (e.g. 65 Hz.) synchronized via the A/D converter. Preferably, light and dark signals are obtained at the leading edge and falling edge of the chopper reference signal, respectively. Each value is stored by processor/controller for a predetermined time (e.g., 5 second buffer memory) to compare current values with previous values. The value of the "dark" signal (background radiation) and the "light" signal are used to calculate an OFFSET value 148, which is differentially compared to the chopper signal from the sensor in the PGA 152. Preferably, OFFSET value is determined so that a positive value is always obtained from the PGA. Knowing the amplitude of the signals, processor/controller calculates an appropriate GAIN value 150, and inputs this value to the PGA 154. Preferably, the GAIN dynamically adjusts the raw signal value to keep the amplified signal in the "middle" of the A/D converter input voltage range, thereby increasing dynamic range and avoiding saturation. For example, if the operating voltage range of the A/D

is 0 to 5 V., the gain applied will maintain the signal value at approximately 2.5 V. ...

(Glasheen, col 7, lines 39-61) What is described in Glasheen is a process in which first a background radiation signal (the “dark” signal) and a signal representing a signal measurement (a “light” signal) are used to provide signals for an amplifier. Then “knowing the amplitude of the signals”, the processor/controller calculates an appropriate gain value, with a goal of dynamically adjusting the raw signal value to keep the amplified signal in the middle of the converter input voltage range.

Glasheen makes use of a programmable gain amplifier 112. (The entire unit 102 is also referred to as a PGA.) This is illustrated in Figure 6 of Glasheen. A processor and controller 106 provide a gain signal 120 to an amplifier. The gain signal received by the programmable gain amplifier is not relevant. This signal is not converted and remains a digital value. (This is consistent with the normal understanding of the operation of a programmable gain amplifier.) This signal affects the gain of the amplifier.

The second value received by the PGA 102 is an offset signal 118 produced by the processor. In this case, the offset signal is converted to an analog value by a digital to analog converter 116 and presented as an input to the difference amplifier 110. However, the intent of the offset signal is not to match a dynamic range of the analog photocell with a dynamic range of the analog to digital converter and being based, at least in part, on ambient light conditions. The offset signal is *not* based on any ambient light conditions. The offset is based on a “dark” value, which is a measurement of “background radiation”, and a “light” value, which is the value of the observed radiation. Therefore, rather than basing the offset on any ambient value, the offset is based simply on the *intensity of the signal*. As indicated in Glasheen, “[t]he PGA preferably includes a difference amplifier

110 and a programmable gain amplifier 112, and is utilized to *adjust signal level as a function of intensity*, and to obtain a signal output that is in the middle of the operating range of the A/D converter 104 to increase overall dynamic range of the system 100.” (Glasheen, col. 6, lines 52-58) It is noted that Glasheen is intended for the purpose of measuring a temperature of combustion and thus it would be expected that Glasheen would not address ambient lighting.

Glasheen may include the use of an ambient *temperature* measurement or value, but this is not relevant to the elements of the claims and is not actually explained in the reference. As shown in Figure 6, an ambient temperature input appears to be applied to the analog to digital converter 104, along with the chopper signal synchronizing signal. However, this input is not explained in the description of the drawing. (See Glasheen, col. 6, lines 58-65) The possible use of an ambient temperature value in the temperature measurement system of Glasheen does not teach or suggest the elements of the claims presented in this application.

It thus is submitted that Glasheen does not teach or suggest the elements of claim 43. It is submitted that the above arguments also apply to claim 48, and claim 48 is allowable for at least the reasons stated above.

Claim Rejections under 35 U.S.C. § 103(a)

Glasheen et al. in view of Gordon et al.

Claims 44-47 and 49-61 are rejected under 35 U.S.C. 103(a), as being unpatentable over U.S. Patent No. 6,354,733 of Glasheen et al. (“Glasheen”) in view of U.S. Patent No. 3,833,903 of Gordon et al. (“Gordon”).

Among other differences, certain differences between Glasheen and the claims are discussed above. It is respectfully submitted that Gordon does not teach or suggest the claims elements that are missing from Glasheen. Gordon discusses a voltage-controlled oscillator for use with analog to digital converters, and is not relevant to the claim elements discussed herein. It is further submitted that the discussion presented above is also applicable to independent claims 53 and 58 and thus the elements of these claims are not taught or suggested by Glasheen or Gordon.

It is submitted that claims 44-47, 49-52, 54-57, and 59-61 are claims dependent on claims 43, 48, 53, and 58 respectively and, among other independent reasons, are allowable as being dependent on the allowable base claims.

Conclusion

Applicant respectfully submits that the rejections have been overcome by the Amendment and Remark, and that the claims are in condition for allowance. Accordingly, Applicant respectfully requests the objections and rejections be withdrawn and the claims be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

Applicants respectfully petition for a one-month extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a). A check in the amount of \$110.00 is enclosed to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.


Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: 1/5/04


Mark C. Van Ness
Reg. No. 39,865

12400 Wilshire Boulevard
7th Floor
Los Angeles, California 90025-1030
(303) 740-1980